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CONTROL POINT RESPIRABLE DUST SAMPLING AT LINGAN COLLIERY 5 WEST SECTION

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CONTROL POINT RESPIRABLE DUST SAMPLING AT LINGAN COLLIERY 5 WEST SECTION

by

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ABSTRACT

Respirable dust samples were collected at the control point in 5 West section at Lingan Colliery immediately before and during trials of Hoy thru-flush picks on the shearer-loader. This report documents that dust sampling effort.

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ÉCHANTILLONNAGE DE LA POUSSIÈRE INHALABLE AU POINT DE REPÈRE DE LA SECTION 5 OUEST À LA HOUILLÈRE LINGAN

par

J.C.Y. Hwang* et D.B. Stewart**

RÉSUMÉ

Des échantillons de poussière inhalable ont été prélevés au point de repère de la Section 5 ouest à la houillère de Lingan immédiatement avant et après l'essai des pics à pulvérisation d'eau Hoy sur la cisailleuse-chargeuse. Le rapport porte sur les travaux relatifs à l'échantillonnage de la poussière.

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INTRODUCTION

As part of a trial of Hoy thru-flush picks on a shearer-loader in the 5 West section of Lingan Colliery, CBDC and CBCRL staff independently conducted compliance-styled respirable dust sampling at the control point with Casella 113A samplers. These samples were collected so that respirable dust generation by the modified picks could be compared with the conventional picks.

The trial was terminated prematurely due to water pressure/volume delivery problems that resulted in frequent blockage of the thru-flush pick water spray nozzles. This report documents the dust sampling results obtained by both CBDC and CBCRL staff.

RESULTS

The shift sampling results from both CBDC and CBCRL sampling programs are tabulated in Table 1. Figure 1 is a plot of tons of coal produced during the sampling period versus respirable dust generated in kg calculated by multiplying respirable dust concentration by air quantity supplied to the wall and by sampling time.

To experienced observers and wall face crew alike, it was obvious that visual opacity was significantly higher when the shearer-loader was equipped with the Hoy thru-flush picks. This suggests a substantially higher airborne total dust concentration. Face-line ventilation volume of approximately 20 m^3/sec did not change significantly over the entire sampling period so the greater visual opacity was expected to result in higher respirable dust results during the thru-flush pick portion of the sampling program. This expectation is not supported by Figure 1.

During the dust sampling shifts, other known dust generating activities in the longwall face area and intake contamination levels were not measured. These other factors may be responsible for the lack of difference between the two sampling subsets. It is also possible that current dust control techniques employed by CBDC on longwall faces are only effective against the non-respirable portion of the airborne dust cloud. This hypothesis will be the subject of future field work.

CONCLUSIONS

The respirable dust sampling program, undertaken by CBDC and CBCRL staff immediately before and during the trials of Hoy thru-flush picks on the shearer-loader does not support the visual observation that the thru-flush picks produced much dustier face-line conditions than the conventional picks. This conclusion must be treated with caution. The sampling program during the thru-flush pick trial period consisted of only six samples collected on three work shifts and the recording of other known dust generating activities was not undertaken.

Table 1 - Respirable dust measurement results for Lingan Colliery - 5 West section before and after installation of Hoy thru-flush drums

Respirable Dust Measurement	Shearer with Conventional Drums					Shearer with Hoy Drums		
DATE	Jan. 21	Jan. 22	Jan. 23	Jan. 24	Jan. 25	Jan. 30	Jan. 31	Feb. 1
MEASUREMENT MADE BY:	CBDC	CBCRL	CBDC	CBCRL	CBDC	CBDC	CBCRL	CBDC
Length of cut by shearer in feet	1165	1390	1545	1685	2075	660	1560	2630
Tons of coal produced per shift	443	528	587	640	789	242	580	833
Respirable dust concentrations* in mg/m^3	0.4, 1.8	4.7, 4.1	4.6, 6.1	6.1, 6.7	4.7, 2.2	0.2, 1.6	6.9, 7.4	5.2, 5.6
Average concentration mg/m^3	1.1	4.4	5.3	6.4	3.4	0.9	7.2	5.4
Total respirable dust generated per shift in kg	0.32	1.44	2.19	2.49	1.45	0.39	2.51	2.33

* Measured at statutory control point with Casella Gravimetric Samplers Model 113A

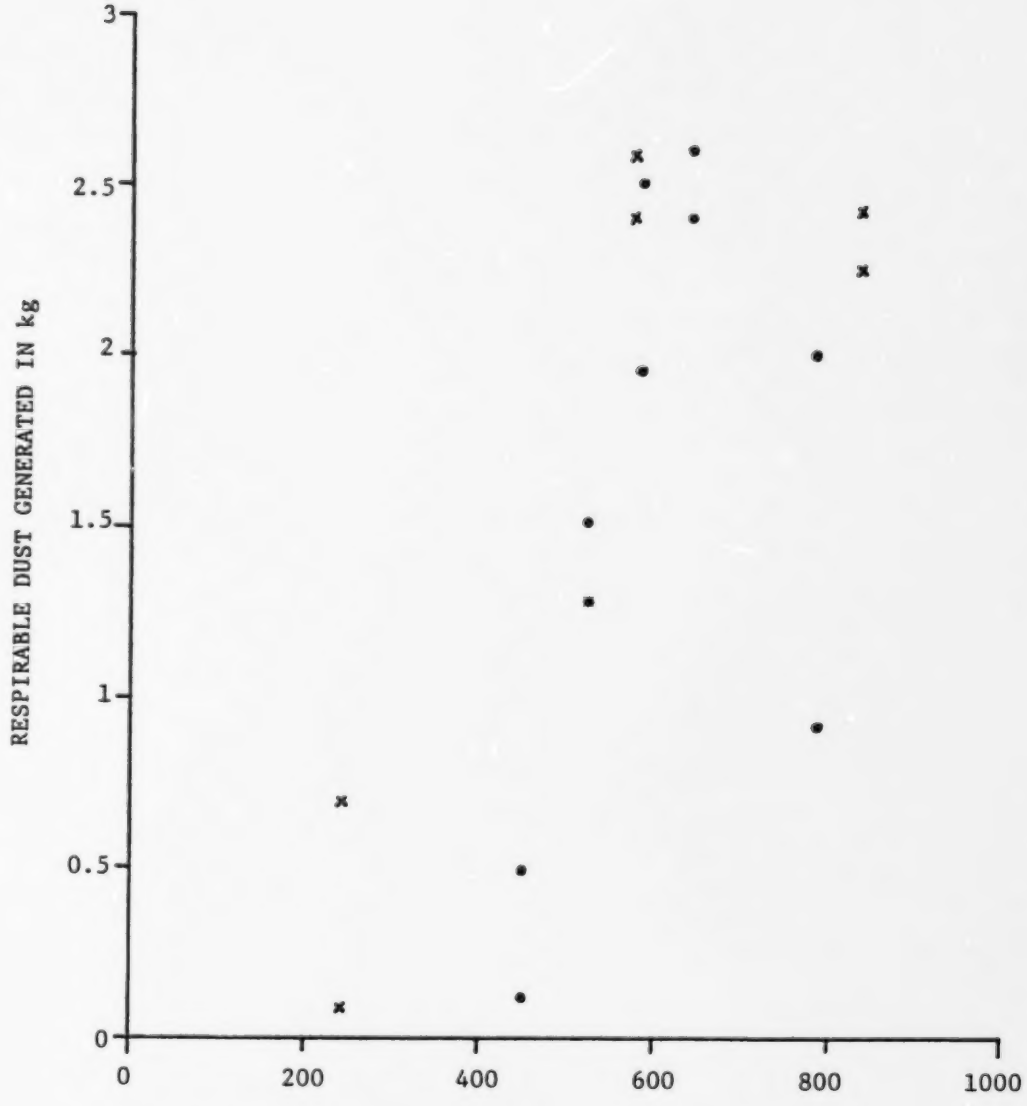

Figure 1 - Plot of respirable dust generation versus tonnage of coal produced during sampling period